

The Manitoba School

A Magazine for Classroom Service

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EDITORIAL

THE BOY PROBLEM IN SCHOOL

That there are many more boys than girls retarded in school is a fact attested by statistics. This difference is made more apparent where promotion is by final examinations, rather than by teachers' recommendation. The number of girl students in our high schools is out of all proportion to the relative numbers of females in the population. Normal schools have in most cases over 75 per cent girl students, commercial schools over 90 per cent, while in the university classes the relative proportion of girls is on the increase, and the registrations are about equal for the sexes. This is in spite of the fact that the traditional courses as at present outlined were in the first place designed as a cultural education for boys and men. The great problems to which education is applied are those which men are carrying out. The agricultural industry of tilling and clearing the land and harvesting crops; the mining industry, the building of highways and railroads, transportation, building construction, the wholesale and retail trade are in the hands of the male population largely, yet in our educational system the male part of the child population takes a secondary place.

Boys are linguistically inferior to girls. They do not do well on examinations, especially in the old-type essay tests. Boys excel in ability to manipulate concrete things. They have a tendency to invention and mechanics, a fact that rather hinders than facilitates their school progress. Boys are interested in unacademic things more than girls. They are more unstable and restless, while girls are more docile and inclined to conform to the prevailing social scheme. Boys are positive and aggressive. The result is too frequently a clash with the instructors, and a growing distaste for school. Worse still for the morale of the child is the unsympathetic attitude of the home.

Half of the failures of the boys are not due to mental inability. The misfit boy is a challenge to the competence of parents, the teachers and the educational system. Are we all addressing ourselves earnestly to the problem?

BOOK REVIEW

Teaching Dull and Retarded Children: A. D. Inskeep, Ph. D., The Macmillan Company, 1929, pp. 455.

Dull and retarded children form a fairly large percentage of the ordinary classroom group. One would expect that methods suited to them should form a part of the normal routine. As one reads this book of Dr. Inskeep's, it becomes evident that this expectation is warranted. For this reason this book is deserving of careful study by every teacher of the junior grades.

Two brief quotations from the text will indicate much concerning the author's ideas. "Too often the retarded child has been tried out in a grade with normal children, and a few sight words, a jumble of sounds, some little reading from memory and a discouraged attitude towards the work are all he has to show for the first year's attendance." "Find out where each individual child is and build on that foundation."

The text does not tell how one is to find these beginnings. Presumably individual diagnosis would give a few lines along which to begin. The author proceeds to set down in interesting fashion hundreds of procedures and generalizations which have resulted from actual work with dull and retarded children. There are opinions; there are mere devices; there are outlines. One feels as one reads, however, that the writer is recommending only what has proved to be successful.

Teachers of normal children will find numerous ways of connecting school instruction with ordinary life activities. The training of the dull is directed specifically to the formation of habits that will be useful in promoting health, making social life more enjoyable, getting and holding a job, conserving time, money and energy, and in using leisure time. The reviewer finds himself very interested in the practical tone of the entire book.

Chapter III on "Reading" and Chapter XIII on "The Education of the Hand" are particularly instructive. In the former chapter there is much material that can be taken over directly into the teaching of our non-English children. In the latter, the place of handwork in the education of the dull pupil is thoughtfully presented.

To teachers of backward classes and to teachers in non-English schools this book is heartily recommended.

Child Psychology: Margaret Wooster Curti; Longmans, Green and Co., 1930, pp. 527, \$3.20.

Congratulations are due the publishers for this attractive little volume. Interest in reading a book is increased when binding, paper, print and color hues are pleasing. One could not wish for a more attractive book than this one. What of its content?

Five chapters of this book are of special merit. In these sections the following topics are discussed: "The Growth of Meanings", (Chap. 8); "The Organization of Meanings in Thinking and Reasoning", (Chap. 9); "General Causes of Juvenile Delinquency", (Chap. 12); "Factors in the Genesis and Control of Antisocial Conduct", (Chap. 13); and "The Growth of Personality", (Chap. 14). In chapters 8 and 9 there is a clear discussion of the development of perceptions, ideas and concepts. Stress is placed upon the facts that growth is continuous, and that it is determined largely by the social environment. There is encouragement and guidance in these chapters for those of us who live and work in the classroom. The writer has included the interesting findings of Piaget concerning the child's growth in ability to reason as he moves from the ego-centricism of his early school years to the impersonal reasoning that begins in the senior intermediate grades. Chapters 12, 13 and 14 should prove very helpful to the class room teacher. Too often the daily work moves along without being shaped by individual human needs. It is well to stop and focus attention upon the human element. In a very practical and interesting manner the author analyzes the social attitudes and the ethical development of children. We are reminded of the importance of healthy school life and routine in their education. We review evidence for, and develop increased interest in, the statement that reflects the tone of this entire section, "Teaching, training and example will determine not only the main trends but also special traits in his personality." These three chapters give usable mental hygiene information. Probably they will help a few of us to realize what a determining factor the teacher is and may be in the child's mental health.

The author sets out to summarize the psychology of normal children of all ages up to and including adolescence. This is a big task. All the usual topics are included. Beginning with the theories, aims and methods of child psychology the summary covers innate equipment, physical and mental growth, conditioned responses, habit formation, ideational activity, play, and many other topics. In parts of the book the reviewer felt the treatment to be scholarly and exhaustive, and yet of the lecture-notebook type. Lengthy discussions without much experimental data char-

acterize these chapters. The sections dealing with Play, Motivation are typical of those so labelled by the reviewer.

The five chapters commended above constitute forty per cent of the entire book. They make the volume a good one. Many teachers will agree that in Chapters 8 and 9 alone they have been well rewarded for time spent in studying the book.

A Short History of Mathematics: Vera Sanford. Houghton Mifflin Co., 1930, pp. 402.

Take your choice of several offerings: the portraits of some thirty mathematicians, a connected story of mathematical discoveries, the history of our denominate number units, the development of calculating devices, non-Euclidean geometries, the growth and simplification of symbols, an extensive list of now-and-then popular problems. If you are weary and choose one of the latter, here it is: "A mouse is at the top of a poplar tree that is 60 feet high and a cat is on the ground at its foot. The mouse descends one-half of a foot each day and at night it turns back one-sixth of a foot. The cat climbs one foot each day and goes back one-quarter of a foot each night. The tree grows one-quarter of a foot between the cat and mouse each day and it shrinks one-eighth of a foot every night. In how many days will the cat reach the mouse and how many fells has the tree grown in the meantime, and how far does the cat climb."

Do not conclude that the book is breezy. Far from it. The non-mathematical will be interested; the mathematical may at times pull the rein on attention. Teachers who wish historical material to illuminate and "touch-off" with interest topics arising from day to day in arithmetic, algebra, geometry and trigonometry will find plenty of it in Miss Sanford's book.

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CURRENT TENDENCIES IN THE SELECTION OF CONTENT AND IN THE METHODOLOGY OF SECONDARY SCHOOL SUBJECTS

M. E. LAZERTE, M.A., Ph.D.

ENGLISH COMPOSITION

Under the heading of English composition we shall include Spelling, Handwriting, Grammar and Oral and Written Expression.

Spelling

During late years the emphasis upon spelling in the elementary grades has been upon mastery of the commonly-used words. Incidental teaching is supposed to take care of the many words which are used less frequently or for restricted periods in the child's school life. There is in each school subject, for example, a written vocabulary that must be used in the classroom while that particular subject is being discussed, but which is used but little thereafter in higher grades.

Misspellings are common in high school grades. In some of the provinces there is no recitation period for "Spelling" on the high school time-table. Where this is the case basic common difficulties should be determined for each pupil and these should be mastered by him. Pupils should keep individual lists of errors and drill regularly upon them. The necessity for this emphasis upon spelling in the high school is apparent when one realizes that, on the average, Grade IX pupils misspell one in every ninety running words, that Grade X pupils misspell one in every hundred, Grade XI pupils one in every hundred twenty, and Grade XII pupils one in every hundred fifty.

Composition is in reality not a subject of study. It is a part of every subject on the school programme. If spelling is to improve, it must be supervised by all members of the teaching staff.

Pupils must be able to spell correctly not only when attention is focused upon the matter of correct spelling, but when attention is directed mainly to other elements in expression. For this reason the status of a given pupil cannot be determined correctly by his success in writing words from dictation. Words must be spelled correctly in context when the writer is not consciously attending to spelling. Though this is true, it is essential that the easier task of spelling lists of words be mastered.

For purposes of testing efficiency in spelling isolated words, the following tests are useful:

1. Buckingham's Extension of the Ayres Spelling Scale, (Grade IX). Public School Publishing Company, Bloomington, Illinois.
2. Sixteen Spelling Scales. Hudelson, Staton and Woodyard. Grades VII to XII. Bureau of Publications, Teachers College, Columbia University.
3. Starch's Spelling List. Daniel Starch. University Co-operative Company, 508 State St., Madison, Wis.

Handwriting

Few pupils who have not learned to write well in the elementary school will master the art in later years. There is much instruction in the junior grades, and pupils may be expected to acquire whatever skill they will normally command.

The high school problem is in most instances one of maintaining the standards reached in Grade VIII. An increased amount of note-taking in high school grades, the absence of handwriting instruction, and the decreasing amount of supervision of all written work, are three factors tending towards deterioration of writing.

To prevent a lowering of quality in handwriting, high school teachers should demand that all written exercises be presented in some standard form that prescribes among other items, type and size of paper, margins, and legibility. Experienced teachers will agree that the settings of standards for form has a very beneficial effect upon the quality of the written content.

Bagley's theory concerning conscious ideals as it relates to transfer of training implies that students may give legible work to one teacher and yet give to other teachers on the staff assignments that are very poorly written. Our inference is that all members of a staff must do their share of supervision.

For scaling samples of handwriting, the following scales are widely used:

1. A Scale for Measuring Handwriting: Daniel Starch. University Cooperative Company, 508 State St., Madison, Wis.
2. The Thorndike Scale for Handwriting of Children: Bureau of Publications, Teachers College, Columbia University.
3. Measuring Scale for Handwriting: Leonard P. Ayres, Public School Publishing Company.
4. Zaner's Handwriting Scale: Zaner. Grades I to XII. Zaner and Bloser Company, 118 North High Street, Columbus, Ohio.

Grammar

Probably one is expected to join the majority and say immediately that grammar as a separate subject should not be taught and that all the indictments against the subject are to be applauded. There is little experimental evidence on this entire question. The writer is one of the minority that believes we have economized time and lost something in educational values in attempting to make the teaching of grammar rather incidental, or probably accidental. When spelling was taught incidentally, it suffered; probably the same result is accompanying our present methods in grammar.

Let us not deny that grammar may be taught as needs arise in composition. Let us rather make sure that these needs are not overlooked. High school seniors are now writing incomplete sentences; their sentence sense is developed little beyond the mastery of a brief compound sentence; they do not understand the function of qualifying groups of words; they cannot organize ideas in a sentence in a clear, purposeful manner. Evidently our high school students do not rank high in grammatical ability.

Grammar as logic and as a science will fail to function with high school pupils. As an art, the result of imitation and habit, the pupil may apply it in interpreting the thought of others and in expressing his own ideas effectively in either oral or written form. Few high school pupils could be interested in grammar as "classification", but all should be interested in the principles of grammar governing usage in speaking and writing.

At each school level teach all the grammar that the pupils will use. Organize the material well. After a topic has been developed, hold all pupils responsible for applying it in their composition. Mark all lapses on these topics as errors; leave other errors unmarked. Convince pupils that they can make better sentences after their study of any grammar topic. Ask pupils to write their exercises or paragraphs freely as ideas come. Teach them to revise and re-write, using their grammatical knowledge in improving the sentences.

At this point one must deal with punctuation. When a pupil begins to judge the relative merits of different sentence constructions, he is keenly aware of the necessity of correct punctuation. If grammar is taught in this manner only a limited amount of it can be covered in any one year, but, it will necessarily be taught during a three, four or five-year period.

We try to make pupils conscious of relationships in history and in science, how much more important it is that they know the relationships among ideas and the words in which these find expression.

One may test only certain basic skills upon which correct writing depends, and attempts to do this have been made through the use of the following tests:

1. Diagnostic Tests in English Composition: Conklin and Pressey, Grades VIII to XII. Public School Publishing Co., Bloomington, Illinois.
2. New York English Survey Tests. Grades VII, VIII and IX. Public School Publishing Company.
3. Wisconsin Tests of Sentence Recognition and Grammatical Correctness. S. A. Leonard, 6705 Yale Avenue, Chicago.
4. Charter's Diagnostic Grammar Test. (Verbs and Pronouns). Grades VII, VIII and IX. Public School Publishing Co.

Oral Expression

At the high school level oral composition should give training in arranging ideas in coherent, sequential order, and in the formation of habits of clear and pleasing expression. If we agree that these are our main problems we will concentrate on them and eliminate difficulties that prevent their realization. Pupils must not be searching for ideas when thinking of form. Oral composition must be based mainly upon content of which the details have been given to the pupils. Further, no pupil can aim successfully at correct expression while worrying over the sequence of ideas. This suggests that written preparation should precede normally attempts at oral presentation.

An adequate amount of informal oral work will centre about the activities of the school societies. In dramatizations, readings and class recitations the more serious training will be featured.

Written Expression

All are agreed that content and organization are matters of first importance, and that the details of punctuation, spelling, choice of words, and sentence structure, are of lesser moment. The majority of children in the high school grades do not write compositions that are models of style and form. The compositions of these pupils must be marked by the teachers for many rather simple errors. A few of the factors in written expression to be considered here are punctuation, capitalization, vocabulary, sentence structure and form.

Punctuation

One tendency at present is to get some progression in the treatment of this topic so that the same items do not appear in the curriculum at all stages of instruction. It has been proved that growth in ability to punctuate correctly is slow from grade to grade. In general there is a high correlation between the merit of a composition when considered with respect to thought content and mechanics. Punc-

tuation becomes an art as the writer becomes proficient. It is not restricted by rules at the higher levels of writing. Few senior high school students have reached the stage where they cannot profit by definite instruction that aims to automatize specific skills in punctuation.

There is a growing tendency to base grade assignments and class methods upon experimental findings. From "Studies in the Learning of English Expression," Symonds and Lee, Teachers College Record, February, 1929, and from "English Composition Scales in Use," Briggs, Teachers College Record, November, 1922, the following guiding information is gathered.

There is great variability in the attainment of any given grade. The middle fifty per cent of any grade shows a variation which is equivalent to the progress of five grades. This suggests that classes should be sectioned, and those pupils of nearly equal attainment instructed together.

The total amount of punctuation used increases from grade to grade in the high school as the quality of the composition increases. The sum-total of errors in composition is a maximum in Grade VI and VII, but the use of the comma before co-ordinating conjunctions is not mastered below the Grade X level. The following table gives the relative frequency in the high school grades of a few specific omissions and errors.

Omissions and Errors	Rank of Omission or Error in Grades			
	IX	X	XI	XII
1. Omission of comma before co-ordinating conjunction	1	1	1	1
2. Omission of comma between dependent and independent clauses	2	2	2	6
3. Comma instead of period at end of sentence	3			
4. Omission of period at end of declarative sentence	4	4		
5. Omission of quotation marks with literary titles	5	3	3	2
6. Omission of comma to set off parenthetical expression	6			3.5
7. Omission of comma before "and" in series		6	4.5	3.5
8. Comma at insignificant pauses			4.5	6
9. Miscellaneous comma errors			6	6

Studies such as the first-mentioned above, which give a complete analysis of errors in the high school grades, furnish much information concerning the content of the curriculum and the points that should be stressed in the instruction of each grade.

Capitalization

The use of capitals is regulated rather strictly by convention, and correct habits pertaining to their use should be relatively easy to acquire. One investigation (*) reports

* "Studies in the Learning of English Expression—Capitalization," Symonds and Lee, Teachers College Record, April, 1929.

that the gross amount of use of capital letters falls off with increasing quality of composition, and that increased use is paralleled by a decrease in the number of errors and omissions. Throughout the high school grades more errors are made in capitalizing nouns than in omitting capitals with proper nouns. Errors in capitalizing titles persists through the high school years.

The frequency of various errors is shown in the following table:

Omissions and Errors	Rank Order of Omission or Error in Grades			
	IX	X	XI	XII
1. Capitalization of common nouns	1	1	1	1
2. Omission of capital in first word of sentence	3	3	5	4
3. Omission of capital in principal words of literary title	3		3.5	2.5
4. Unnecessary capitalization of other parts of speech	3	5	3.5	
5. Omission of capitals for proper nouns	5	3	6	
6. Capitalization of common adjectives	6	3	2	2.5

Vocabulary

One phase of development in composition ability is the growth of vocabulary. As one's power of expression increases a greater variety of words is used and meanings show flexibility in connotation. Through extensive reading the pupils acquire richer associations that result in a nicer use and understanding of words. Skill in interpreting and expressing thought readily, fully, and accurately, is dependent upon this extension of vocabulary.

Thorndike (*) has classified words according to the frequency with which they are used in written expression. In the compositions of pupils of Grade IX, according to Symonds and Lee (**), about fifty per cent of the total number of words are from the first one hundred in the Thorndike list, and over fifty per cent of those used by pupils of Grade XII are from the same list. One is impressed by the fact that relatively few words are used by high school students. Eighty-five per cent of the writing vocabulary of Grade XII students is from the first one thousand words on the list.

Vocabulary appears to have a genetic order of development. Teachers who are planning their instruction will prefer to choose their words for vocabulary study from that particular class of words in the mastery of which growth

* Thorndike, E. L., "The Teacher's Work Book," Bureau of Publications, Teachers College, Columbia University.

**Symonds and Lee, "Studies in the Learning of English Expression," Teachers College Record, October, 1929.

takes place most naturally. From the study of Symonds and Lee the evidence is that vocabulary study in the high school grades should be organized as follows:

Grade	Words on Thorndike Scale to Receive Main Attention	Supplementary Lists Thorndike Scale
8- 9	From 500 to 2000	2000 to 6000
9-10	From 500 to 2000	3000 to 7000
10-11	From 1000 to 2500	500 to 600 3000 to 9000
11-12	From 1500 to 3000	3000 to 9000

Pupils who read widely will normally grow in ability to use words correctly. They should be led to see the importance of, and be interested in, a command over language.

Sentence Structure

Compositions may be very imperfect, though faultless in so far as sentence structure is concerned. Correct sentence structure is a subordinate and elementary phase of good form. High school students have not the ability in expression that ensures any complete mastery of the sentence as the simplest thought unit. An understanding of grammatical principles should eliminate errors such as incomplete sentences, purposeless repetitions, dangling participles, pronouns with incorrect reference, phrases and clauses incorrectly placed, and parallel constructions of unequal importance. These errors are characteristic of the written work of high school students and they reflect the imperfections of their thought and logic.

In a report on "Sentence Structure", by Symonds and Daringer (*) the following facts, among others, are thrown into relief:

- (a) In Grade IX there is, on the average, about one error or fault to every sentence.
- (b) In Grade XII there are approximately three errors to every five sentences.
- (c) Sentence structure is one of the most significant signs of the general quality of writing.
- (d) From Grade IX through early university years there is a continual decrease in the use of pronouns, and writing becomes more impersonal.
- (e) Through the elementary grades, and again in university years, there is a gradual increase in the use of adjectives, but, during high school years there is little change in practice.
- (f) Through Grades IX and X there is an increase in errors due to misplaced modifiers. The pupil appears to be experimenting with variations in sentence order.

* Symonds and Daringer, "Studies in the Learning of English Expression," Teachers College Record, October, 1930.

- (g) Weak, broad or divided reference of pronouns is the most prominent error in sentence structure throughout the high school grades.
- (h) Sentences with unrelated or vaguely related clauses strung together, with or without conjunctions, has second frequency in Grade IX, but drops to fifteenth place by the time the pupil reaches Grade XII.
- (i) Unnecessary repetitions hold approximately seventh place throughout the four years.

One sees in the analysis, here summarized in part, evidence that it is possible and probably desirable to base our methods upon investigations that show the natural lines of growth. Content as well method may be derived from such studies.

Content and Sources

The tendency at the present time is to rely less and less upon literary sources for the content of pupils' compositions, and to draw chiefly from the life experiences of the pupil. As the details of mechanics are mastered, the pupil is allowed to perfect his form of expression, while relieved of the task of recalling memorized or partially-memorized subject-matter. The tendency is to use ready material and thus relieve the pupil of forced creative work.

There is a further tendency to make composition the work of the entire school. All teachers on the staff are co-operating in the business of improving the pupil's power of expression. The teacher of composition is turning to texts in other subjects for source materials, and teachers in departments other than English, are passing along to the teacher of composition the assignments received in their subjects.

Form

Throughout the high school years there should be definite training in the organization and presentation of ideas. Continuity of development, unity within parts, and balanced relationships between parts should continuously improve. During senior high school grades pupils should be very much aware of this necessity for logical and balanced continuity. Irrelevance in parts within the sentence, of sentences within the paragraph, and of entire paragraphs in the whole composition, will be gradually eliminated.

A decade or two ago much attention was given to the form of a composition and little interest was taken in the naturalness of the content. The pendulum has swung to the other side of the arc. As is usual in such instances, there appears to have been too great a change.

Style in writing presupposes a maturity in matters of form that are, in most of its aspects, above the working level of the high school student.

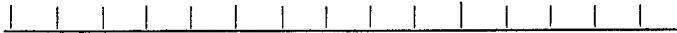
ARITHMETIC

M. E. Lazerte, Ph.D.

GRADE I

For this month, which is rather short, the amount of new material to be introduced is not great. The following types of exercise should be continued.

1. Counting forward from 1 to 10.
2. Counting backward from 10 to 1.
3. Looking at an unmarked scale—



and naming each position. The ten-position and the five-position serve as reference points.

4. Pointing to the correct position along the scale when asked to point to 'one more than five', 'ten', 'two less than ten', 'two less than five', 'three', 'two more than five', etc.

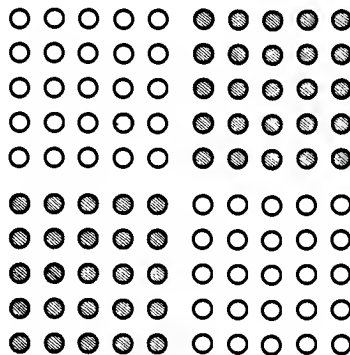
5. Naming each of the positions indicated in (4) without actually marking them.

6. Oral exercises without any visual aids: one and one, one less than five, two more than five, one less than ten, etc.

7. Putting to one side on the bead frame any group under ten that is named as in 'seven',



8. Ability to name any position in the first decade of the following chart, to point to any named position, and to use the chart as one method of deducing any desired combination.



Average pupils will be interested in counting along the chart beyond the first decade. As they become familiar

with the number series in this way they are acquiring basic notions concerning the number system.

We not only have numbers, we have a number **system**. Pupils must know the system. Later, in notation, and in all work with decimal fractions, they must use the system. They must understand that .45 and .2 do not make .47, and long before this they must have some slight notion of what is really taking place when in multiplication they use the abbreviated form

$$\begin{array}{r} 78 \\ 34 \\ \hline 312 \\ 234 \\ \hline 2652 \end{array}$$

Why do we talk of borrowing in subtraction? Why do we shift the second partial product to the left? Why do we accept .42 as an approximation to .417? If notions such as these are to be understood in the senior grades, we must at least introduce the child to the system in Grade I.

9. Using the paper rulers to determine the number facts taught to date.

1	2	3	4
1	2	1	2

10. Writing of the symbols 1 to 10. In teaching the symbols begin with those that are easy to make, progressing from the straight-line symbols such as 1 to 7 to those that are more difficult, such as 3 and 8.

11. Oral problems applying the number facts taught.

12. The number facts from 1 to 10 covering the following items:

- $0 + 0$.
- $0 +$ each number up to 10.
- the reverse of facts given in (b).
- unity added to each number up to 9.
- the reverse of facts given in (d).

These five groups include the following:

0	1	0	2	1	0	7	0	1	2	4	0	0
7	1	2	1	5	1	0	8	2	0	1	6	3
7	3	3	0	5	5	8	9	0	6	6	0	4
1	0	1	4	1	0	1	0	0	0	1	9	0
9	1	1	10	0	1	1	0	8	1	1	1	
1	0	6	0	5	8	9	10	0	4	7	3	

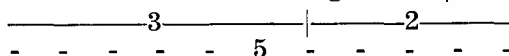
Drill on these facts is given on sheet No. 6 of Primary Number Booklet, Grade I.

Development of Number Facts

Various procedures that may be used in the development of any number fact are given below. Class exercises should generally include review of parts of old material so that the pupil may be kept thinking. If exercises are based too exclusively upon the new items pupils may work largely by routine. If, for example, the facts $1+5=6$, and $5+1=6$ are being taught, a few exercises using these ideas will be given first, but, exercises on $1+2$, $1+1$, $2+1$, etc., will be intermingled with those on 1 and 5, otherwise the pupils' attention will be focused upon only 1, 5 and 6, with the result that they will be able to guess many of the results.

Typical Exercises and Problems

- Stand at 'five' on the floor scale or point to 'five' on the blackboard scale.
- Find one more than five.
- Use markers and the colored number chart to find the value of $2+2$, $9+1$, $5-1$, $1+1$, $1+5$.
- Place the one-inch ruler against the end of the five-inch ruler to find 'five and one'.
- Draw a line three inches in length, using a ruler marked in inches only. Increase the length of the line by two inches. Measure the total length. $3+2=5$.



- When a review is desired on any list of number facts ask pupils to prepare strips of paper as follows:

1—	1—	11—
2—	2—	12—
3—	3—	13—
4—	4—	14—
5—	5—	15—
6—	6—	16—
7—	7—	17—
8—	8—	18—
9—	9—	19—
10—	10—	20—

Give questions orally and ask pupils to record their answers, putting an 'X' in any space where they are unable to record the answer.

- Give seat-work from the blackboard. It is assumed that during the first couple of months the necessary vocabulary will be taught in the reading periods.

Draw 5 flags. Color 3 of them red. Make the others blue.

Draw 5 large chairs and 1 small chair.

Draw 2 large red flowers and 1 small yellow flower.

8. Oral problems based on specific facts taught given as in (6) above.

- (a) There are three girls and one boy in our party. How many are there in the party?
- (b) There is one bird in the tree. If six more birds come to the tree, how many birds will be there?
- (c) Bob has five marbles. He wins one more. How many has he?
- (d) Draw on the blackboard the following articles marked with their prices:

orange—4 cents	stick of candy—2 cents
apple—1 cent	banana—3 cents
grapes—5 cents	

Find the cost of a bunch of grapes and an apple; a banana and a stick of candy; a banana and an apple; a banana, a stick of candy, and an apple.
- (e) Blackboard illustrations as in (d).
 Jack has 10 cents. If he buys only a bunch of grapes he will have left _____ cents.
 If he buys only an apple he will have left _____ cents.
- (f) I had six pencils. I can find only four of them. How many have I lost?
- (g) I am eight years old. How long will it be before I am ten years old?
- (h) Tom and Fred have seven rabbits. Tom owns five of them. How many of the rabbits belong to Fred?
- (i) I picked ten flowers. I gave mother seven of them. How many have I left?
- (j) How much money is five cents and four cents?

9. Problems based on bead frame, number chart, etc.

- (a) A man takes three steps and then two more steps in the same direction. How far is he from where he started?
- (b) A man takes three steps and then turns about and takes two steps towards the place from which he started. How far is he from where he started?
- (c) Place a button on the number chart at five. Put another button four places farther along. How many are five and four as you read it from the chart?
- (d) If you have five cents can you give away four cents. Can you give away seven cents?
- (e) Draw a line six inches long. Cover four inches of it. How much of the line remains uncovered?
- (f) Mary invited ten girls to her party but only nine of them could come. How many of the girls could not come? (Use number chart).
- (g) Jean had five pieces of candy. She has eaten four of them. How many pieces are left?

SILENT READING

D. J. Dickie, Ph.D.

GRADE II

Progress in the Second and Third Years More Rapid

By the end of the first year the children have made a beginning in all the different processes of reading. They expect to get thoughts from the page, they enjoy reading, they have begun to form correct habits of eye movement, of word and sentence recognition. In Grade II they enter upon the period of rapid development of skill in the fundamental habits inculcated in Grade I. With proper instruction and practice they grow very rapidly during the second and third year.

Thought Getting Essential

Thought getting is the essential characteristic of reading. It is so easy for the child to come to think of reading as word naming, that it is necessary to emphasize the thought getting aspect very strongly in Grade I. As a result, at the beginning of Grade II, his thought getting power may be somewhat in advance of his word recognition and eye-movement habits. It is the special problem of Grade II to bring up to standard the child's power of word recognition: to extend his word and phrase vocabulary and to increase his power to get new words from the context and by phonics. If he is prevented from forming any wrong habits of eye movement, special training for development in this third fundamental element of reading may be left till Grade III.

Three Types of Reading Practice

In addition to special stress on word and phrase recognition, the teacher of a Grade II class should try to increase the pupils' love of reading by introducing him to many new and attractive books, to deepen his comprehension by daily testing of the material read, to keep up and improve his eye movement habits by giving him plenty of easy reading material and to develop his power to read aloud in thought units and with expression.

To achieve these aims, the teacher uses the three types of reading lesson suggested for the first grade: Silent, oral and drill lessons. During the first month or six weeks of the autumn term, the children should read first grade material. Each child should read several new primers and first readers, and reread any of the old ones which attract him. This

reading of very easy material enables him to regain the skill lost in the long vacation, improves his eye movement habits, and gives him a feeling of power.

Separation of Slow and Fast Readers Advisable

Investigation has proved that in Silent Reading in Grade II the advanced and average pupils profit more by informal extensive reading than by formal instruction lessons. Pupils who read more than sixty words per minute with infrequent errors seem to be retarded by instruction, while children who read less than sixty words with two or more serious errors per minute grew little with extensive reading, but improved steadily under formal instruction. It would seem wise, therefore, for the second grade teacher to divide her class into two divisions for which she can provide different kinds of reading practice.

Special Attention to Slower Pupils

For the slow moving group, daily silent reading lessons of the formal type should be given on the selections in the basic reader. The good readers should participate in these lessons on two or three days of the week. A stimulating introduction helps both comprehension and speed. The problem question should focus attention on the principal thought of the selection. It is often better to give the direction "read as quickly as you can without skipping" than to set a time limit which is apt to make slow children nervous. The pupils should read the lesson straight through to the end without skipping. If a child cannot get a word or phrase from the context or by phonics, he should be told at once, the teacher making a note of the difficulty, and drill later. Work and phrase study should follow the discussion and should be specially stressed in this grade.

When long stories are read, it is sometimes impossible to finish the lesson in one day. If the preparation and silent reading are taken together, the discussion and word study of the following day should be preceded by a rapid silent re-reading of the piece. This rapid re-reading helps to form correct eye movement habits. For the re-reading, the teacher should assign a new problem, set a shorter time limit or suggest a purpose as a future oral reading or dramatization of the selection.

Text Exercises for the Good Readers

On the remaining two or three days of the week, extensive silent reading practice may be provided for the good readers by preparing in advance exercises, checks, and tests on the stories in the supplementary readers available. When the poor readers of the class are having their regular formal instruction lesson in reading, the good readers may be

allowed to read to themselves any of the selections, or any of the story books which the teacher has ready for them.

The teacher prepares these selections, or books, by writing out on a card a series of test questions on each selection or book. When the pupil has finished reading his selection, he gets the card of questions from the teacher's desk and answers them. If his answers are satisfactory the teacher gives him credit on the score card, or Reading Roll, for having read that particular selection.

This method of free silent reading may be used with advantage by the good readers in all the grades. The cards are not difficult nor do they take long to prepare. The older pupils may even, as composition exercise, prepare them for the juniors. The test exercises may be questions to be answered in the ordinary way in a sentence, or they may be any kind of objective test. For Grade II it is wise to make them as simple as possible, questions which require "yes", or "no", but a single word in answer; exercises in which both question and answer are given, and the pupil has only to match them.

Examples of this last type of exercise:

Puss-in-Boots

Who died? — the second son.
Who got the mill? — Puss.
Who got the donkey? — the ogre.
Who got the cat? — the king.
Who asked for a bag? — the men.
Whom did Puss catch? — the haymakers.
Who was eating egg? — the eldest son.
Who sent the gift? — the princess.
Who wore a pink satin gown? — a rabbit.
Who were cutting hay? — the youngest son.
Who were sawing logs? — Marquis of Carolear.
Who turned into a Mouse? — the Miller.

The word and phrase answers can be printed on small cards and left loose in an envelope with the questions. The pupil sorts them out and arranges them in the proper order after the questions.

COMPOSITION AND LANGUAGE

A. J. Watson, B.A.

GRADE III

LESSON LXI

STORY FOR REPRODUCTION

The Begging Bears

Willie Brown Bear gazed at his mother in astonishment. Was she going to take him and Sister Gertrude to that old road again and force them to sit there all day just as they had been doing for a week? Yes, just sit in the road and do nothing else.

Willie and Gertrude wanted to play in the nice cool woods and eat the juicy ripe blackberries which made their tongues a beautiful red. But no, Mother Bear wouldn't allow them to go away from the road a moment.

"Wait and see, my dears," she said. "You'll be glad you minded your mother some day. Stay here in the road and watch and listen."

"What for, Mother?" asked Willie. He was a very curious little bear and always wanted to know the reason for everything.

"Don't ask questions, Willie. You'll know in time."

"I'm so hot sitting here in the sun all day," whined Gertrude. "Can't I go into the woods and sleep awhile?"

She thought this plea would surely make her mother change her mind, for it was not long ago that she had been scolded because she would not take her nap.

"Never mind the sun, Gertrude. It will make your fur thick and shiny. Besides, you were not always so anxious to take a nap. Come, take your places or we may be too late."

Willie and Gertrude saw that it was useless to argue further. But it did seem foolish to sit and sit in an old bare road all day long and do nothing else. They hoped whatever their mother was looking for would soon come. They couldn't stand this much longer.

They had barely taken their places when their keen little ears heard the strangest sounds. A roar like thunder, a hiss like a snake, gradually growing into the most awful noise they had ever heard. A queer, nasty smell also came from the terrible thing, and Millie and Gertrude ran to

their mother. Never had they seen or heard anything like this. What could it be?

They tried to run into the woods and hide, but a cuff on the ears from their mother's strong right paw brought them back in a hurry. The monster came closer and closer. It was bigger than a dozen bears and its breath was awful. It roared louder and louder and Willie and Gertrude hid their faces in their mother's fur. Oh, if they had only run away!

Suddenly the roaring stopped and the little bears felt their mother moving away from them. They hardly dared to open their eyes to see what had happened. But open them they did.

And what do you suppose they saw?

Why, Mother Bear was walking right up to the monster as if she were not a bit afraid. They saw something come flying at her. She caught it in her mouth and came back to the two little frightened bears.

"Come, see what I have for you," she mumbled. "Now we can go into the woods and have a feast. This is what we have been waiting for all the time."

When they were safe in the woods, Willie Bear began to ask questions, "What are we eating, Mother?"

"Bread, Willie. Isn't it good? Here, Gertrude, have some, too." She tore off a big piece and gave it to Gertrude.

The two little bears ate and ate until their mother made them stop. Never had they eaten such delicious food. They wanted to know how to get more.

"What do you call that animal, Mother?" asked Willie, licking his lips wistfully.

"That was an automobile bringing tourists into Banff Park. The people in those cars give us good things to eat if we sit right here in the road and beg. For the rest of the summer you'll not lack for food if you don't forget your training. Aren't you glad you waited now?"

"Yes, I want to see another automobile right away," said Willie eagerly.

"Me, too," said Gertrude looking around for another crumb.

Oral questions:

What were the bears' names?

How long had they been waiting on the road?

Give two reasons why the young bears didn't like to wait.

What happened when they did hear a car?

How did Mother Bear make them behave?

Tell three things the young bears did not like about it.

What did Mother Bear do?
How did she know she would get food?
Why did she not eat it all herself?
What was the food and how did they enjoy it?
Who fed the bears and what did Mother Bear tell her children?
Have you ever been to Banff, Waterton or Jasper Park?

Seatwork:

Tell about your trip to the park. Tell about seeing some wild animals, about trying to get their pictures or about feeding them.

LESSON LXII

LETTER WRITING

The teacher will write a sample letter on the blackboard, then teach the correct form of address and date, of salutation and ending.

With the co-operation of the class another letter is written. The pupils suggest all the material including the sentences to be written.

Sufficient drill is given to impress the name and position of each punctuation mark.

For seatwork the children will copy the letter neatly from the blackboard.

Other suggested topics: What we do at recess. How we are getting ready for Christmas. The game I like to play.

LESSON LXIII

PICTURE STUDY



Oral discussion:

What time of the year is it? What kind of country do these children live in? How far from your home are mountains like these? Where is the nearest sleigh-riding hill?

How many sleds do you see in the picture? How many children? How are they dressed? What is each child doing? How is a sled started when there is a heavy load on it? How is it steered? How could you upset the sled when it is going fast? What happens when it does upset?

Seatwork:

Tell about getting a new sled from Santa Claus, and about the fun you had with it on Christmas afternoon.

LESSON LXIV
CONVERSATION STORY
Learning to Skate

Tell about getting the skates for a Christmas present, about having them fastened on to the proper shoes, about putting on two pairs of stockings and lots of other clothing to keep warm. Tell about the difficulty of standing on the skates, about them sliding from under you, about the help you received from older people. Tell where you like best to skate and what you intend to do when you grow up (i.e., hockey).

Seatwork:

Write a short story telling about your first attempt at skating, about your tumbles and how everybody laughed at you.

LESSON LXV

Teach the following opposites:

boy—girl	king—queen
sister—brother	grandmother—grandfather
uncle—aunt	husband—wife
prince—princess	goose—gander
son—daughter	duck—drake
niece—nephew	lion—lioness
lord—lady	hen—rooster

Seatwork:

Write the opposites for: princess, brother, nephew, son, gander, girl, lioness, hen.

LESSON LXVI**STORY FOR REPRODUCTION****The Kind Little Sparrow**

Mr. and Mrs. Meadow Lark had quite a large family. "The very largest and brightest we have ever had," said

Mrs. Meadow Lark to her husband. "Yes", answered Mr. Meadow Lark, "but the baby is far too venturesome. You must watch him carefully, my dear."

"Just think, he was the last to hatch out; in fact, I was beginning to be discouraged when he finally pecked the shell, and looked at me with his bright black eyes." Mrs. Meadow Lark sighed, but it sounded like a trill.

"Well, my dear, if you will get the children dressed, and bring them out on the lower limb of the apple tree I will give them their singing lesson. The sun has been up over an hour and it is quite time," Father Meadow Lark peeped at the sun, shining through the leaves.

Mother Meadow Lark and the five little Meadow Larks were soon seated on the apple tree and learning their "do-re-mi-fa-sol" forward and backward.

After a while, Baby Meadow Lark began to look around and while Father Meadow Lark was giving special attention to Topsy Meadow Lark, who was learning the trill, Baby Meadow Lark hopped down to the ground. The ground wasn't very far, so Baby hopped along by himself until he was quite out of sight.

But soon he looked around and called "do-re-mi-fa-sol." Why did not his mother come? Then he called again. He was hungry and had not learned where to find his food. What should he do? He was just about to call once more, and his mouth was open to say "do" when a nice fat seed fell in. There in front of him sat a little gray sparrow. "Cheep, cheep, cheep!" he said. What he meant was, "I'll get you more if you are hungry," and he did. Finally he hopped a little way and called, then hopped a little farther and called again. Baby Meadow Lark knew that he was supposed to follow, so he hopped a step and flew a step, the little sparrow keeping ahead of him. In just a few minutes he heard someone singing, "do-re-mi-fa-sol." He was so delighted to hear his father's voice that he answered him by singing the little song backward and forward and ending it with a little trill. Then the kind little sparrow said "cheep, cheep," which meant "good-bye," and flew away.

Oral discussion:

How many larks are mentioned?

Why do you think there were more?

What is meant by "the baby is too venturesome?"

Why was he called the baby?

Tell when and where the singing lesson took place.

How did Mother Lark get them ready?

Who taught the lesson?

What was the hardest part to learn?

Can you do it?

How did Baby Lark get lost?

Who took care of him?
What makes us think the sparrow had children of her own?
How did she start to teach him to find food?
What did Baby Lark do when his father found him?
How did the sparrow say "good-bye"?

Seatwork:

Tell about a real baby wandering off from home, about everybody getting excited and rushing everywhere to find him. Tell where he was found at last and what he was doing?

LESSON LXVII**LETTER WRITING**

Review the previous lesson, drilling on any parts the children found difficult.

Let the children write a letter for themselves, but under the teacher's general supervision. Letters of two or three sentences are long enough.

Suggested topics: A party I attended. Decorating the Christmas tree. A snowball fight.

LESSON LXVIII**PICTURE STUDY****Oral discussion:**

Is this Christmas Eve or Christmas morning?
How can you tell?
How tall is the tree?
What did they do to make it look larger?
How many presents can you find on it?
What do you think is in the big box?
How do you know the girls rushed to the tree as soon as they awoke?
Who put the presents on the tree?
What present will they like best?
What must they do before they can start to play with their dolls?
In what other ways will their Christmas be made "Merry" besides getting presents?

Seatwork:

Tell how you prepare for Santa Claus, when you expect him to come and what you really want most of all for a present. Tell about sending presents to other boys and girls.



LESSON LXIX

CONVERSATION STORY
Building a Snow Man

Talk about the kind of snow that is needed and the kind of weather. Tell how you get the snow together, how many separate rolls you need and the size of each. Tell how you put on the arms and head, how you make the mouth, nose and eyes. Tell how you dress the snow man.

Seatwork:

Write four or five sentences telling how a snowman is built.

LESSON LXX

Teach the correct use of 'broke' and 'broken'.

Drill on use of helpers: is, are, was, were, have, has, has been.

Put in the correct word :

1. She _____ the pencil.
2. The dishes are _____.
3. He _____ the cup.
4. Is the picture _____?
5. Have they _____ the glass?
6. Jack _____ his crown.
7. What have you _____?

LESSON LXXI

STORY FOR REPRODUCTION

Ganymede, the Mexican Cat

Vera Cruz,
Mexico.

Dear Grade III Girls and Boys:

I am a Mexican cat and was born on a ranch on the slopes of the big volcano Popocatepetl, which means "smoking mountain." My kittyhood was spent among big trees, mountains, and rivers. My friends were the little Indian boys with whom I used to play a great deal. I was happy up there; the only thing that sometimes disturbed my happiness was when some hunter's dog tried to chase me. This usually happened when I was wandering a little too far away from home, but I always succeeded in outrunning them, as I knew perfectly well the many paths that led toward my master's house.

At sunset one day when I returned home I found that I had new masters; my old ones had moved and left me behind. From that moment my happiness ended, at least for a time. My new masters either didn't like me or didn't want to feed me. They were always chasing me out. I think this happened because when they came to the house I was not around and they mistook me for a thief. After a while I made up my mind to leave the ranch and went on walking through the mountains. I suffered very much and almost starved. One day, bright and sunny, I met some boys who were camping out there. They treated me fine and gave me some food. One of them in particular was very nice to me. He caressed me all the time and I surely felt happy again.

After a while they bade me good-bye and started down toward the city, but I didn't want to part with them, especially with the boy who had treated me so kindly, so I followed them for about two hours. When we got to the foot of the mountain they surely were surprised to see me. They discussed what they should do. Presently the nice boy took me in his arms and after patting me in a friendly way, put

me into a bag and all of us resumed our journey. So I had a new master already.

Now I live in the city of Vera Cruz, and am very, very happy. My name is Ganymede. At first I didn't like it much, I tell you frankly, but since I have learned that Ganymede is the name of a very large star, and so I am content with it. My master likes to study the stars, and I think that is why he chose this name for me.

One Sunday morning he asked me to get ready because he was going to take my picture. Oh, I was never so pleased! I wanted to appear all spick and span, so I licked and licked my fur till my master grew impatient. He fixed a cushion on the table and placed me upon it and a vase beside me. At his signal I looked into the lens of his camera; the result was a very fine picture of me, and I am very proud of it.

Please give my love to the cats in Alberta.

GANYMEDE.

Oral discussion:

(Tell the class something about Mexico, about the kind of country and the habits of the people. Get a map and find Vera Cruz on it.)

Try to say 'Popocatepetl'.

What does it mean in Indian language?

Why is it called this? What else does a volcano send forth?

Where was Ganymede's first home?

With whom did he play?

Who were his chief enemies?

Why did he leave home?

How did he get along?

Who found him at last?

Why did he follow them?

Where is his home now?

How did he get his name?

How did he prepare for his picture?

To whom does he wish to be remembered?

Seatwork:

Tell about your own cat.

Tell what color and size it is.

Tell what tricks it can do and how it spends most of its time.

LESSON LXXII

LETTER WRITING

Drill on the correct form of letter writing.

Write letter to Santa Claus.

Recopy the letter after corrections are made.

LESSON LXXIII
PICTURE STUDY



These children live in England and they too are preparing for Christmas. They have a lot of branches in their hand which they find growing wild. We have to buy these in the stores.

What are they?

What are the leaves and berries like?

Why do we always have holly at Christmas time? (Tell the children about its being a sacred tree in the time of the Druids, and about the early Christians keeping it for its value in decorating.)

The children also are dragging in a big piece of wood called the "Yule-log."

What will they do with it?

What kind of fireplace do you need for it?

Is the boy getting a free ride or merely resting to have his picture taken. (Tell the children about the history of the "Yule-log. Tell about "Yule being a great feast among the early pagans and how the Christians turned this feast in our modern Christmas celebration.)

LESSON LXXIV

CONVERSATION STORY
Christmas

Tell about the meaning of Christmas and why it is such a joyful season. Talk about the story of Saint Nicholas and about being kind to poor people. Talk about Christmas presents and what the children expect to receive. Talk about decorating the Christmas tree and about Christmas entertainments.

Seatwork:

Write a short story telling what you expect to receive for Christmas and what you intend to give your friends.

LESSON LXXV

Riddle:

I am a man.
I have long white whiskers.
My suit is bright red.
Everyone is excited when I am coming.
After I am gone everyone is happy to see what I left for them.
Who am I?

Oral:

Children guess answer to riddle.
Make up a riddle about a doll, a dog, a snowman, a table, a clock.

Seatwork:

Write a riddle of three or four sentences about something else in the room. Let the other children guess the answer.

LITERATURE SUGGESTIONS FOR DECEMBER

The Reader, pages 85, 86; 93-106; 113, 114.
Special Literature—The Pied Piper of Hamelin, p. 100.
Memory—The Shepherd's Song.
Stories—Mother West Wind's Animal Friends.
Dramatization—A Visit from Santa Claus.
Suggested questions from several selections for oral or written exercises:

— A —

I Do! Don't You?

1. Name the four seasons of the year.
2. Tell what thing liked each season best.
3. Give two reasons why each of the different things liked that season best.

— B —

1. Where is Hamelin?
2. What strange thing happened there?

3. Tell two ways they tried to get rid of the rats.
4. How did they get rid of them?
5. Describe the Pied Piper.
6. Why did the Pied Piper take the children away?
7. What did he make the children believe?
8. Why is music never heard in the streets of Hamelin?
9. What lesson does this story teach you?

— C —

Four Sunbeams

1. What did the four sunbeams resolve to do?
2. Where did the first sunbeam go?
3. What did it do when it got there?
4. Where did the second sunbeam go?
5. Of what did it make the invalid think?
6. Where did the third sunbeam go?
7. What did it do to the flower?
8. How did the fourth sunbeam do a kindness?
9. When did the sunbeams meet?
10. What had they found out?
11. What lesson do we learn from this story?

— D —

The Land of Story Books

Tell the story of this poem in your own words.

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ARITHMETIC

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GRADE IV

MULTIPLICATION

3	30	300
3	30	300
3	30	300
3	30	300
3	30	300
3	30	300
3	30	300
3	30	300
3	30	300
3	30	300
3	30	300
—	—	—

$$3 \times 10 = 30$$

$$30 \times 10 = 300$$

$$300 \times 10 = 3000$$

$$3 \times 100 = 300$$

$$30 \times 100 = 3000$$

$$3 \times 1000 = 3000$$

Give drill on the types:

7	18	30	60	74	100
10	10	10	10	10	5
—	—	—	—	—	—
5	100	15	100	30	87
100	15	100	30	100	100
—	—	—	—	—	—

$$32 \times 1000 =$$

$$17 \times 10 =$$

$$365 \times 100 =$$

$$37 \times 100 =$$

$$108 \times 10 =$$

$$365 \times 1000 =$$

$$5 \times 10 =$$

$$209 \times 100 =$$

$$305 \times 100 =$$

Extend multiplication as taught in November to include three-digit multipliers.

4276	4276	4276	4276	4276
300	40	7	347	347
—	—	—	—	—
1282800	171040	29932	29932	29932
			171040	17104
			1282800	12828
			—	—
			1483772	1483772

Preparation for Division

Review division facts as given on sheets 9, 10, 11, and 12 in Primary Number Booklet, Grade III.

$4 \div 1$	$8 \div 2$	$7 \div 2$	$11 \div 2$	$14 \div 3$
$18 \div 3$	$25 \div 3$	$20 \div 3$	$13 \div 4$	$21 \div 4$
$31 \div 4$	$23 \div 4$	$7 \div 4$	$35 \div 4$	$29 \div 4$
$31 \div 5$	$41 \div 5$	$26 \div 5$	$8 \div 5$	$19 \div 5$
$35 \div 6$	$3 \div 6$	$47 \div 6$	$45 \div 7$	$15 \div 6$
$55 \div 6$	$62 \div 6$	$4 \div 6$	$27 \div 6$	$55 \div 7$
$33 \div 7$	$48 \div 7$	$35 \div 7$	$7 \div 8$	$76 \div 8$
$65 \div 8$	$13 \div 8$	$3 \div 8$	$45 \div 8$	$34 \div 9$
$66 \div 9$	$17 \div 9$	$2 \div 9$	$62 \div 9$	

Fractions

A _____
 B _____
 C _____
 D _____

A means the length of the line at A.

2A means twice the length of this line.

1. Find: A, B, 2A, D A, B C, C, C D.

2. Draw lines of the following lengths (use rulers):

1 in., $1\frac{1}{2}$ in., $2\frac{1}{4}$ in., $1\frac{1}{2}$ in. + $\frac{1}{2}$ in., $1\frac{1}{4}$ in. + $1\frac{1}{4}$ in.,
 1 in. + $1\frac{1}{4}$ in., $2\frac{1}{2}$ in. + $1\frac{1}{4}$ in.

How long is each of these lines?

Notation

Teach notation to include millions. There are three points upon which attention should be focused, (a) that beginning at the right the places in the system fall into groups of three, e.g., 2,346,214,357, (b) that the first group on the right names units, the second names thousands, the third tells how many millions there are, and (c) that extra zeros must be inserted to fill spaces on the left in any of the groups if there are to be any digits in the next group to the left.

Drill on each of these points separately. Co-ordinate them. Give preliminary drill on reading numbers such as:

37	309	1407	30060	317
20	1400	1007	241007	1427
300	1420	2060	32060	

Use the frame device for a few days and then discard it.

millions			thousands			units		

Focus attention upon facts such as, (a) If a number begins with thousands, it begins in the second three-digit

group, and (b) If it begins with millions it extends from the third three-digit group.

After discarding the frame one might profitably use a second device, -----, -----, -----, giving the pupils practice in choosing the section which is to be filled in first.

Problems

In all the following questions you are to draw a line to show what you think the answer should be. The answer to one question is given to show how the others are to be completed.

Problem: If the line ----- shows how far a man can walk in 3 hours, draw a line to show how far he can walk in 6 hours.

In 3 hours -----

In 6 hours -----

1. Four boxes of apples cost money that we picture by the line ----- . Draw another line to show the cost of one box of apples.
2. The number of bushels of potatoes that Sam can dig in one day is shown by the line ----- . Draw another line to show how many he can dig in 3 days.
3. Tom had 100 marbles. He lost 25 of them.
This line means 50 marbles: -----
Draw a line to show how many marbles he lost.
Draw another line to show how many marbles he had left.

Application of Fractions and Denominate Numbers

1. How many quarts are there in $2\frac{1}{2}$ gallons?
2. How many pints are there in $2\frac{1}{2}$ quarts?
3. Find the cost of ----- quarts of milk at $10\frac{1}{2}$ cents a quart.
4. Find the cost of ----- quarts of milk at $5\frac{1}{2}$ cents a pint.
5. Fill in the blanks:
3 pints = ----- quarts.
1 bushel = ----- gallons.
 $1\frac{1}{2}$ quarts = ----- pints.
----- quarts = 5 pints.
10 cents a quart = ----- cents a pint.
----- cents a gallon = $4\frac{1}{2}$ cents a quart.
60 cents per bushel = ----- cents per half bushel.
 $\frac{1}{2}$ cent per inch = ----- per yard.
6 yards for \$1.00 = ----- yards for 50 cents.
----- yards for 50 cents = 6 yards for 25 cents.

Train pupils to study given data to determine which

portions are relative to the problem in hand. For each problem given below put an (X) in front of the items of information that are needed.

1. What was the total value of a farmer's wheat crop?
() Number of acres of oats. () Number of acres of wheat. () Price of a bushel of wheat. () Cost per acre of growing the wheat. () Number of bushels per acre.
2. What was the price paid for a farm?
() The amount of taxes each year. () The number of acres. () The distance from town. () The number of acres under cultivation. () The price per acre.
3. What was the amount of our coal bill last winter?
() The size of the furnace. () The price of a ton of coal. () The size of the house. () The number of tons of coal burned. () The number of days the furnace was burning.
4. What amount did father earn last month?
() The number of days he was idle. () The number of days he worked. () The wages per day. () The number of hours he worked each day.
5. What was the value of our potato crop?
() The price of one bushel of potatoes. () The number of rows in the field. () The number of bushels from the first row. () The number of bushels from the field.

General Problems

1. In 1930 Ash Wednesday came on March 5th, Easter Monday on April 21st, and Labor Day on September 1st. How many days were there from Ash Wednesday to Easter Monday? How many days were there from Easter Monday to Labor Day?
2. Postal charges are as follows:
Letters: 2 ct. for first oz., and 2 ct. for each additional oz. or fraction. Special delivery 20 ct. additional.
Parcels: Merchandise, etc. To any post office within 20 miles irrespective of Provincial boundaries: 1 lb., 5 ct.; 2 lb., 6 ct.; 3 lb., 7 ct.; 4 lb., 8 ct.
Beyond 20 miles but within Province: 1 lb., 10 ct.; 2 lb., 15 ct.; 3 lb., 20 ct.; 4 lb., 25 ct.; 5 lb., 30 ct.
Registration Fee: (letters) 10 ct. in addition to postage.
 - (a) Find the cost of sending a special delivery letter weighing less than 1 oz. from Edmonton to Calgary.
 - (b) Find the cost of sending a registered letter weighing 2-1/2 oz.
 - (c) Find the cost of sending a 4-1/2 lb. parcel from Edmonton to Lethbridge.

Making Posters.

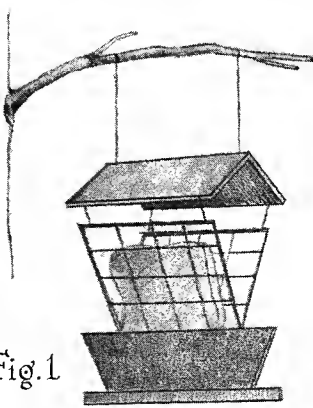


Fig. 1

Here is a drawing of a device for feeding birds. At the right are two patterns or design-units made from it.

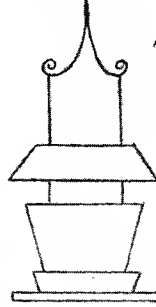


Fig. 2

On the right is a pattern or design-unit made from the side view of Fig. 1

The design at the left is made from Fig. 1



Fig. 3

Below the way to make a design from a bird form is shown.



Fig. 4.

Make quick rough sketches in pencil of bird shapes. Then reduce them to simple line drawings, and break up the areas into parts as shown. Finish in line or in flat tones of gray or color.

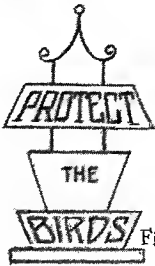
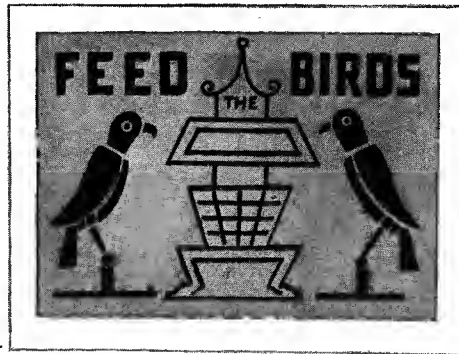


Fig. 5.

Try various ways of arranging the lettering, making quick pencil sketches



Select one of the sketch plans and complete.

ART**R. W. Hedley, M.A., B.Educ.****G. F. Manning, M.A.**

GRADE V

The problem for this month is the making of a poster, to illustrate some such topic as "Kindness to Animals," or "Protection of Birds," etc. This problem is illustrated in Book III, of "Elementary Art", (problem 4, of Grade V.) The type of lettering to be used on the poster is also shown on this plate of drawings, and teachers are referred to this exercise, as the alphabet is not reproduced on the plate of drawings accompanying this article.

The accompanying plate of drawings illustrates a method of developing a poster which will suggest the idea of "protection." One method of protecting wild creatures is to see that food is provided for them, particularly for birds in the winter months. So we may make a start with a drawing of some feeding device, and from this work out a design unit which may be used on the poster.

In Fig. 1 a drawing in pencil of a feeding trough for birds is shown. Children may copy from a magazine illustration, or from any other source, such a drawing as is shown in Fig. 1. Not all pupils need use the same object. Some may begin with a water bowl or trough, others a bird-house, yet others an illustration such as the one shown here (Fig. 1.)

The next step is to get a pattern from this illustration. We may take the front view or the side view, as shown in Figs. 2 and 3, and make simple symmetrical shapes from these, working in pencil, or scrap paper, and varying the shapes as much as our ingenuity permits. No carefully finished sketches are needed at this stage; instead we require a variety of simple patterns from which we may choose one for the poster illustration. While the final drawing or design unit may not resemble closely the object from which it has been made by successive changes, the pupil realizes that it is a form of the object from which he started and the idea of "protection" is thus preserved.

The next step may be to introduce the form of the animal or bird thus protected. In this case, the bird has been chosen. Fig. 4 shows how to make a conventionalized bird shape. Starting with a quick pencil sketch of the bird, in outline, the pupil then experiments by means of rough pencil sketches, to get a shape which will suggest the bird form from which it was obtained, but, at the same time, will not

be a naturalistic drawing. Once children have been shown how this may be done they will very eagerly make experiments of this kind. The teacher will frequently find it necessary to urge pupils to keep the designs as simple as possible, many children running quickly to over-elaboration of pattern.

Some practice may well be given here to coloring the bird form finally chosen. It may be finished in black water-color, or in black and gray. Again colors may be used, or color with both black and gray. Obtaining a colored pattern will provide one or more interesting seat-work exercises. All the other steps, outlined above, will also provide seat-work.

Some practice will next be given, after the lettering has been decided upon, on the lettering required to complete the poster. This again is a seat-work exercise.

The final exercise in the problem is that of making a pleasing arrangement of the units chosen for the poster. When the dimensions have been decided upon the pupils should, on scrap paper, drawing freely and roughly, make a number of arrangements of the various units, leaving room in each for the necessary lettering. The unit worked out from the feeding device may be made central, and the bird forms may be balanced, symmetrically, on either side of this. From several such quick sketches the most promising is chosen, as the design to be completed carefully.

Now the pupil may take a piece of practice paper, the same size as the poster, and, following the plan decided upon, draw very carefully the various parts in their proper positions. He will also complete the lettering. When this has been done he may talk over, with the teacher, or other pupils, the finished design, to see if some improvements are possible. If such improvements are suggested, they may be made. The design, complete in line, and carefully redrawn, may next be traced on to the sheet of good paper reserved for the finished poster. By working so the surface of the good paper is kept clean, and further, is undamaged by numerous erasures, it will in consequence, take washes of color much more evenly than would otherwise be the case. If preferred, however, the design may be made directly upon the good paper. It remains now to finish the poster by adding flat washes of black, gray and color.

Alternatively the poster may be planned first, the feeding trough being made central and the birds symmetrically balanced on either side. Then the work of turning this realistic drawing into a conventionalized rendering would next be commenced, the steps being similar to those outlined above. This method reverses the one first outlined.

Teachers will protest that this work is too advanced for Grade V. In answer to this criticism it will be admitted that much poor work will result, but probably not more than in English composition at the same stage. We persevere with composition because we believe it can be improved in time. If we followed, in composition, the plan many teachers adopt in the art lesson, we should write a model composition on the blackboard, and have children copy this neatly into their exercise books. No sane teacher believes that by this method alone could composition be economically taught. The child learns by making mistakes. It is suggested here that in the art work we provide him with the same opportunity for growth. Our aim should be not a perfect reproduction of the teacher's copy, but a growing and developing mind.

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GEOGRAPHY

J. M. Roxburgh, M.A.

GRADE VI

GERMANY

Area and Boundaries.—Germany has nine countries on her borders, and touches two bodies of water which are of commercial importance. This has some relation to the fact, (1) that Germany is a great trading nation, (2) that she is a warlike nation.

Bordering on Germany are France, Switzerland, Czechoslovakia, Poland, Lithuania, Denmark, Holland, Belgium.

Its shores touch the North Sea and Baltic Sea.

Its area is 181,000 square miles. Compare this with Alberta's 255,000 square miles. (Ratio 4.3).

Its population is 63,000,000. Compare this with France, 40 million, and Britain 44 millions.

Climate.—The factors affecting the climate are: (1) It lies in the Temperate Zone and in the latitude of Manitoba. (2) The climate is moderated in winter more than ours by the nearness of the sea and the effect of the warm Gulf Stream. (3) Westerly winds bring fairly heavy rainfall, and (in winter) considerable snow. (4) Southern Germany is in the hilly regions near the Alps, and owing to its elevation therefore no warmer than the coast region.

Drainage.—Three rivers traverse the country, the Rhine, the Oder, and the Elbe. These are used much for transporting goods and there are canals joining the Rhine and the Rhone in France. On the Elbe is the large seaport of Hamburg. On the Oder is Stettin, and on the Rhine, Cologne.

The rivers have been of value to Germany in getting their manufactured goods down to the seaports at the mouth, and in getting raw materials and food from foreign countries into the interior. The north banks of the Rhine, being on the sunny side of the river, are devoted to grape growing and the production of wine. Coal is carried to the sea on the rivers. Wheat, wool, cotton are carried inland, and since the war iron ore also.

Agriculture in Germany.—The Germans are careful and skilled farmers. The products are rye, barley, oats, potatoes, turnips, sugar beets, cabbages, and other vegetables. Wheat is grown, but is a lesser crop. Dairying is carried on

in the hilly districts of the south, and in the moist regions along the coast.

Manufactures.—Coal is mined in large quantities and some is exported, but iron ore must be imported.

Sugar beets supply sugar for the large population.

Textiles for home use, and for export are made in large quantities, including woollens, cotton, linen, silk.

Wine is produced in the Rhine Valley.

Fine instruments used in scientific work are made, such as surgeons' instruments, telescopes, opera glasses, microscopes, knives.

Many of the toys sold in the shops in Canada come from Germany.

Cities.—Berlin, the capital and largest city, has a great university.

Hamburg is terminus of lines of steamships connecting with all the chief countries of the world. The canal and rail system gives it connection with Berlin, Dresden, and other inland cities.

Bremen is on the Weser and has a foreign trade.

Stettin is a seaport on the Baltic. A disadvantage is that the straits connecting with the North Sea are closed in winter with ice. It has trade with Baltic ports in iron ore, timber, manufactures. Essen is in a coal field near the Rhine. It has manufactures of iron and steel.

Cologne is in the Rhine region near the coal fields.

Leipsig has a famous university, has manufactures of textiles, and is a great fur market.

Dresden is near the Polish coal fields. Chinaware is an important product.

QUESTIONS AND EXERCISES

1. Sketch a map of Europe outlining only Germany and the neighboring territories. Print in the names of the countries on its borders and the coast waters. Mark in four rivers. Print in the names of cities on these as given above. Locate also Leipsig and Berlin. Mark the coal fields on the Belgian border and on the Polish frontier.
2. Name five products of the farm in Germany. How are these suited to the climate?
3. Compare Germany with Manitoba in population, area, and climate. Explain the reason for differences in the farm products.
5. Complete the statements:
The largest city of Germany is _____. The city noted for its fine chinaware is _____. The seaport on the

Baltic is The seaport on the North Sea is
Two cities manufacturing articles of iron and steel are
The great world fur market is Wine
is made in the region

6. Give three reasons why many of the toys in our shops are made in Germany.
7. Name seven articles manufactured in Germany on a large scale.

BELGIUM AND THE NETHERLANDS

Belgium resembles France in population and industry, while Holland is more like Germany.

Belgium is the most densely populated country in Europe. The people cultivate their little farms as if they were gardens, but they must still buy much of their food from abroad. With Canada the trade is considerable in wheat and flour.

Belgium has for centuries been famous for its linen and woollen goods. Cotton and linen lace are made by the peasants and sold in the towns for export. Antwerp is the great port of Belgium and it is connected by means of the Rhine, the Scheldt, and numerous canals with the interior of Europe. Brussels is the capital, and is famed for its carpets.

Holland is called the Netherlands because it lies low by the sea. Much of the land has been reclaimed from the sea by building of dykes, over which the sea-water was pumped, leaving dry land to be used for cultivation. Windmills are much used as a source of power and for pumping out the sea water. The soil of this low area has been washed down by the Rhine and is very rich.

The Dutch keep many dairy cattle and they ship the butter and cheese to England and elsewhere. Bulbs, such as tulips, hyacinths, and narcissus are grown. Sugar beets are a source of sugar. As the Dutch own valuable islands in the East and West Indies they receive from these rubber, pepper, cinnamon, cocoa.

Fishing is done in the North Sea, mostly for herring.

Amsterdam is the greatest port. It is noted for its diamond polishing industry. Rotterdam is another port and is on the Rhine.

QUESTIONS AND EXERCISES

1. Copy the outline of these two countries from a large map. Mark the countries on the border and the sea on which they face. Mark the Rhine and the Scheldt. Show the coal field in south-east Belgium. Mark the cities named above.

2. Connect the items in the first line with those of the second by cross-lines:

Brussels is noted for	The rivers of France and Germany.
Amsterdam's chief industry is	A seaport on the Rhine.
Rotterdam is	The Scheldt River.
Antwerp is located on	Diamond-cutting.
Antwerp is connected by canal	Being capital of Belgium.

3. Account for the dense population of Belgium. Why is it not able to grow sufficient for its needs?
4. Describe the agriculture of Holland. Also the foreign trade. Why is fishing an important industry?

THE SCANDINAVIAN COUNTRIES

The Peoples.—The three countries, Norway, Sweden and Denmark are occupied by people who are very much alike in character and language. They can understand each other's languages fairly well. They are big, strong, fair-haired people.

Denmark is the smallest of the three countries. It is a land of farmers. The soil was originally low and sandy, but has been much improved by tree planting and careful fertilizing and cultivation. They keep many cows and pigs, and they raise hay, oats, barley, and rye. Owing to the nearness of the sea there are heavy rains most of the year. This causes pastures to be good. The butter, cheese, and bacon from the farms is shipped to England and to other countries requiring imports of food. The schools of Denmark are among the best in the world. Copenhagen, the capital, has factories of fine pottery, and many industries, besides supplying the people with manufactures.

The Scandinavian Peninsula.—This is made up of Norway on the west coast and Sweden on the east. The climate is moist from the nearness to the ocean and the prevailing winds from the west. The Gulf Stream flowing along the west coast helps to moderate the winter climate, otherwise it would be as cold as Labrador, and uninhabitable. The Gulf Stream brings the warm waters from Florida across the Atlantic and has a great effect in making the climate tolerable in winter.

Norway.—This country is of interest for the snow covered mountains of the interior, the great waterfalls near the coast, the great forests, the sea where codfish and herring supply food and a means of earning money for many of the people, and the beautiful "fiords" or narrow inlets along the coast. Norwegian ships sail in every sea and their sailors are great navigators and ship-builders.

Sweden.—Sweden has more forest land and more farm

lands than Norway. It has a much larger population. The farms produce potatoes, turnips, barley, rye, oats, and hay. It is too moist and cool for wheat. Sweden sells to the world matches, iron ore, lumber, paper, butter.

Iceland.—This is now an independent republic, but the people are Scandinavian. Sheep are raised. The chief industry is fishing. The capital is Reykjavik, located on the west coast. A volcano, Mount Hekla, is one of the famous sights of Iceland.

QUESTIONS AND EXERCISES

1. Sketch a map of the Scandinavian countries. Locate on it Oslo, Stockholm, Copenhagen, Bergen, Hemmerfest (the northernmost town in Europe.)
2. Underline the correct statements:
 - (a) There are (three, four, five, Scandinavian countries.)
 - (b) Denmark lies in latitude (south, north, even with, Winnipeg.)
 - (c) Norway extends (almost to, beyond, the Arctic Circle.)
 - (d) These countries are (rich, not rich, in minerals.)
 - (e) The most mountainous is (Denmark, Iceland, Sweden.)
 - (f) (Farming, manufacturing, mining) is the chief industry of Denmark.
3. Complete the statements, referring to the text, page 157.
 - (a) The Danes ship out large amounts of _____. Their product sells well because _____. The capital of Denmark is _____. It has a large trade with _____. (Picture page 157.)
 - (b) The coast of Norway resembles that of _____. It has a great number of _____. The main agricultural products are _____. Another large industry is _____. Large quantities of fish are shipped from the port of _____. Hammerfest is located _____. It is the centre of _____ industry. Tourists go up the Norway coast to see _____. Power in Norway is produced by _____. It is used in large industries such as _____.
 - (c) The climate of Sweden as compared with that of Norway is _____ and _____. The chief crops on the farms are _____ (6). The chief mineral found in Sweden is _____. The ore is shipped to _____. The capital is _____.
 - (d) The capital of Iceland is _____. It is situated _____. The people of Iceland are employed chiefly in _____ and _____.

ELEMENTARY SCIENCE

G. R. Rowe

GRADE VII

(Continued from last issue)

How Butterflies and Moths Differ.—Although moths and butterflies belong to the same order and are alike in many respects, there are some differences which we will note. In the first place, butterflies are usually brightly colored and fly about mostly in the day-time. Moths are more drab in their coloring and fly mostly at dusk or at night. Then when a butterfly alights on a flower, its wings are held upright and usually open and close slowly as though expressing a mild content. When at rest, the moth folds its wings flat along its back and they are held motionless. The body of the butterfly is usually quite slender while that of the moth is broader and shorter. An interesting difference is to be noted in the antennae. In the butterfly it will be noticed that each antenna ends in a knob while in the moth the antennae are hair-like or feathery and are not knobbed at the end.

Some Common Butterflies.—Everyone should learn to recognize some of the commoner butterflies and moths. Usually the first butterfly to appear from its hiding place in the spring is the Mourning Cloak. Then come the little Blue Butterfly, the Tortoise Shell, the Satyr, and the Banded Purple. In summer we have the large yellow Tiger Swallow-tail. There are many others besides these. Among the moths, pupils will meet with the large Cecropia or silkworm moth, the Hummingbird moths, the Hawk moths, the Underwings, and various kinds of “dusty millers” which lay the eggs from which come the injurious cutworms and caterpillars.

EXAMINATION QUESTIONS

1. Name at least seven harmful and eight beneficial insects.
2. Where do grasshoppers obtain their food?
3. What are the names of the three body divisions of the grasshopper? Describe the antennae, the compound eyes, the simple eyes.
4. What are the parts of the mouth of an insect? State the use of each part.
5. How many divisions of the thorax are there? What structures are attached to each part? Describe the wings and legs of the grasshopper.

6. Describe the abdomen of the grasshopper. Explain how the female grasshopper lays her eggs. How does the grasshopper breathe?
7. Describe how a small grasshopper grows to be an adult grasshopper.
8. Why do farmers become alarmed when grasshoppers are rapidly increasing in numbers?
9. Name four respects in which the structure of a house-fly differs from that of a grasshopper.
10. Describe the life history of a house-fly.
11. Explain why house-flies are a source of danger. Explain how this danger may be reduced.
12. Explain why pouring oil on the surface of stagnant pools tends to keep down the number of mosquitoes.
13. What very noticeable difference in structure exists between the house-fly and the mosquito?
14. What are the characteristics of the group of insects to which the Cabbage Butterfly belongs?

LESSON V

FALL STUDIES IN PLANT LIFE

Dissemination of Seeds

Importance to the Plant.—It has been noted in a previous lesson how much care seems to be lavished on the care of the flower and the production of seed. To grow seed is, in fact, the final purpose of every plant in so far as Nature is concerned. Having produced the seed, precious to the plant, the next care is in the distribution of it so that every little plant springing up from it may have the best chance possible for success. It is true that many seeds come to nothing through failure to get a good start in life, but there is provision made that as many as possible get a new location some distance from the mother plant. Some of the devices for securing dissemination are mentioned in the following paragraphs. Students should continue the observations along these lines beyond the facts noted in the lesson. It is a fact that every plant in its wild state has some special device for securing the scattering of its seed abroad, and pupils should be ready to investigate this phase of plant life on every suitable occasion. The chief agencies doing this work for the plant are wind, water, birds, and man.

Wind.—In order to be carried any great distance by the wind, a seed must be very light. Some seeds are not only light but have plumes, as in the case of the Dandelion, and Thistle, the seeds of which are by this means carried long

distances in the wind. The wings on the seed of the Manitoba Maple aid in its flight. Some plants, like Tumbling Mustard and Russian Thistle, break off at the ground when ripe and are blown long distances. Such plants scatter seed along the way. In winter, the cones of many evergreens drop off and the little winged seeds are shaken out and blown along the snow-drifts.

Water.—Seeds are scattered by water in two ways: rivers and moving bodies of water carry the seeds on their surface. Here and there, along the way, the seeds will find a resting-place on the shore or bank. In other cases, seeds drop on the surface of water and are blown across the surface of pools and small lakes. This is a further evidence of how Nature does not depend on any single agency to carry out her work. Most plants that grow in or near the water edge are aided by water in the spread of their seeds. Examples: Water Lilies, Palms, Cocoanuts, Poplar Catkins, Willow Catkins, tops of Sweet Clover in the irrigation ditches, etc.

Birds.—The fruits of the Wild Cherry, Plum, Currant, and Raspberry are often carried long distances by birds. They are then eaten and the seeds either dropped to the ground or later expelled from the crop. Migratory birds sometimes carry seeds on their feet and legs for long distances, particularly when they are disturbed and startled into flight.

Animals.—Many plants, like the Beggar Tick, produce seeds with claws. These claws attach the seed to the hair of animals and are carried away from the parent plant. Squirrels, gophers, and other rodents, carry nuts and seeds to their hiding places. These seeds often are not eaten and in time grow into plants. Often the actual seed of a plant is enclosed in a stone or hard centre. Animals in eating seeds do not always swallow the stone.

Man.—Birds and animals do not intentionally scatter seeds. Man, with his superior mentality, depends on the careful distribution of seeds in carrying out his farming operations. Seeding time on the farm is when man scatters seeds by means of machinery, although in ancient times it was done by hand. In many cases man quite unconsciously scatters seed. The boy who eats an apple on the way to school and throws away the core is doing just what Nature wanted him to do in order to scatter the apple seed.

Chances a Seed Has to Survive.—From one seed grows a plant and from the plant comes many seeds. Yet all seeds produced do not find an opportunity to grow; that is the reason why a plant produces so many seeds. There is no possibility that all will find fruitful soil, but there is a hope that some of them will. Birds and animals eat millions of

seeds and these millions are destroyed. Wind, water, animals and birds scatter seeds, but the seeds are not always left in a place where they will grow. Water in many cases kills seeds. Rocks and sands will not permit their growth. Often one plant will choke or kill the offspring of other plants. In farming, man aims to control the growth of all seeds. He tries to grow only that kind that will yield him a profitable harvest. By constant cultivation, he keeps down weeds and other plants. For all these reasons the chances seeds have to grow are few. Nevertheless, the balance of Nature sometimes gets out of control, and weeds infest the fields where once valuable farm crops grew.

Some plants produce only a limited number of seeds, others produce thousands. A Potato grows six to ten tubers, Wheat yields from ten to fifty times the number sown, and Oats from ten to a hundred. Dandelions yield thousands, so do Tumbling Mustard, Stinkweed, Lamb's-quarter, and many other weeds.

The average farmer realizes the surplus his grains will yield and he retains sufficient seed to assure a supply of seed grain. Wheat requires from one to two bushels per acre for seed; Oats, two to four, depending on the soil and climate. The surplus grain that our farms produce is put on the market. From this surplus comes the Wheat, Oats, Rye, Barley, Corn, Buckwheat, Potatoes, fruit and vegetables that are sold on the public markets of the world. The average wheat crop of the prairies is about twenty bushels per acre. The farmer must keep from five to ten per cent of his wheat for seed purposes.

Dissemination of Weed Seeds.—Seed dissemination is of particular importance to the farmer because a number of the most troublesome weeds on the farm are difficult to control owing to their manner of spreading their seeds abroad. A number of examples of these are noted below.

The Canada Thistle is rapidly becoming one of our worst weeds. Long ago it was confined to the eastern parts of the country but it now has a foothold in the West. The seeds are ripened in the fall. They form in tufts, many hundreds on each plant, and when ripe are attached to a light feathery down which is seized by the wind, and this seed is carried long distances. They become lodged in grain fields and, however careful the farmer may be, soon spread and increase in numbers by their underground root-stocks.

Perennial Sow Thistle is another troublesome weed whose seed is spread by the wind in much the same manner as that of the Canada Thistle. The down attached to the seed is very light and with the slightest breeze is wafted along with the seed attached to it to new locations. Thus a farmer, however careful he may be, is unable to guard his

fields from the introduction of this serious pest if his neighbors let one single plant grow to maturity; it will pass the weed on to his adjoining farm.

Dandelions are spread in the wind and have proven a special nuisance in lawns where there does not seem to be any way of keeping them in check. On golf courses, bowling greens, etc., they soon become rooted if the seed by any chance is blown there from waste or neglected gardens in the vicinity.

Russian Pigweed is becoming a prevalent weed in the province. The plants are seen to be extending out into the country from the railroads and it is apparent that dispersal is accomplished by means of the soil carried on the wheels of carriages or the feet of animals. The light tips of the plant are seen drifting in the wind off the road-sides and the weed will thus penetrate the farms. The weed is, however, not difficult to keep in check on cultivated land.

Various kinds of weeds are spread in the seeding of grain by the use of impure seed. The fact that ordinary machine separation will not clean Wild Oats, False Flax, Wild Mustard, Ball Mustard, from the grain in which the seeds are found is a means of spreading them.

Mention has been made above of certain cases where the whole plants are rolled across the country in the wind. This is the case with Tumbling Mustard, and Russian Thistle, both of which are fairly common in the southern parts of the prairie provinces.

EXAMINATION QUESTIONS

1. Experiment with seeds of Caragana to illustrate seed dispersal. If the pods are left in an open vessel in the room, soon one after the other will begin to discharge the seeds with some force, throwing the contents across the room.
2. Collect seeds which pupils find clinging to their clothing. Among these will be found Yellow Avens, Agrimony, Blue Bur, Burdock, Spear Grass. Some seeds with down attached, such as Cottonwood, Willow, and Fire-weed or Willow-weed, will be found to use this mode of dispersal.
3. Wind dispersal may be illustrated by a project of the class or of individual pupils for the exhibition collection shown on Visitors' Day. Various methods may be used to carry out this project. One method is to place the seeds in vials which may be purchased at a druggist's. These may be arranged on a card in a row, with the title

above: "Seed Dispersal", and the name of the seeds printed on a label on each vial. A second method is to paste the seeds in squares or circles on the card and cover with cellophane, a kind of transparent paper used as a wrapper on many products.

4. Make lists of trees, shrubs, or herbs, whose seeds are distributed by the following means: Winged seeds, seeds with a feathery plume, seeds enclosed in a fruity pulp attractive to birds, seeds attractive to squirrels, seeds with wings or sails, seeds in grain, seeds carried in the mud of the farm or road.
5. Why is it particularly difficult for a careful farmer to prevent his farm becoming infested with Canada Thistle or Perennial Sow Thistle?
6. Notice the long feathered growth on the seeds of the Prairie Anemone or Pasque Flower. What method of dispersal does this provide?
7. Notice the white down in the pods of Milk-weed and Great Willow Herb. How is this down an aid to seed dispersal?
8. What special device for seed dispersal is illustrated in the following: Raspberry, Saskatoon, Hazel, Oak, Dandelion, Tumbling Mustard, Burs, Stink-weed, Maple Ash, Cottonwood, Wild Oat, Foxtail Grass?
9. State four agencies that assist in the distribution of seeds. Name three seeds distributed by each.
10. Discuss the chances a seed has to survive and grow into a plant.
11. Name several agencies that tend to destroy seeds.
12. Why must the farmer wage a constant war against weeds?
13. How does man depend on over-production for a living?
14. How many bushels of (a) Wheat, (b) Oats, are required to seed an acre?

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LITERATURE

C. S. Edwards, B.A.

GRADE VIII

BIRDS AT EVENING

The Author.—Miss Pickthall was born in England, coming to Canada at the age of seventeen. For some years she lived in Toronto, later in Vancouver. Two small volumes of poems are her contribution to Canadian literature—"A Drift of Pinions" and "The Lamp of Poor Souls." Her work has many admirers among those who appreciate beauty and imagination in poetic form. Her early death in 1922 was a matter of great regret.

The Subject Matter of the Poem.—This little poem illustrates well the qualities of Marjorie Pickthall's poetry, namely, (1) deep religious feeling, (2) beauty of rhythm, (3) delicate perception of beauty.

As an exercise the pupils should read the poem through, marking or writing down the phrases which call up in the mind a beautiful picture or thought, taking only the first two lines of each stanza. There are ten at least. Then find out the religious thought repeated in each refrain—the providential care of the birds which all things mentioned recall to the poet's mind.

"Rooks" are birds resembling crows common in England. "Iris-flower" is the blue-flag. "Martin" is a species of swallow.

Line 2 of stanza 1 may be taken to mean that the grey of the evening brings silence and a dreamy feeling reminding us of silver.

QUESTIONS

1. What are the ten things that are connected with evening?
2. What does the poet say she is reminded of as these things are seen?

GUILD'S SIGNAL

The Author.—Bret Harte is an American poet and novelist, whose works deal with adventures in the Western States and the gold fields of California. His poems deal mostly with the rough life of the mining camps, but the present one relates a story the scene of which is laid in the Eastern States.

Synopsis of the Poem.—Guild was a railroad engineer whose home was in Providence, Rhode Island. He used to

signal to his wife as he passed out of the town, using two low whistles, which she would recognize as meaning that all was well. People who travelled on the line used to smile when they heard Guild's signal, and would tell others that it did not signify anything serious, but was "only Guild calling his wife." Thus it went on day after day for years. Then one night the sound was missed by the people of Providence, and they said to themselves that Guild had for once forgotten it. Little did they know what the truth was. Guild's engine had been wrecked and he lay under the wreck dead.

"Bagmen" are travelling salesmen. "Commuters" are persons travelling regularly, and therefore pay a lower rate (commute means to reduce.)

Stanza four: The district through which the railway lay was mostly a farming community. The whistle was heard "through the budding boughs," that is, in springtime; and again "when the red leaves burned like living coals", that is, in autumn.

QUESTIONS

Stanza 1—What was Guild's signal? Where was his home? Why does he say "the farms lying white"? Explain "on to the light" (probably morning.)

Stanza 2—What did the signal mean to the wife? What three elaborate love greetings are compared with this in stanza 2?

Stanza 3—Who smiled at the engineer's salute to his wife? What did they tell those who asked what it meant?

Stanza 4—Show the metaphor in "billows of grain", "budding boughs", "red leaves". What simile in this stanza? Explain ll. 30-31.

Stanza 5—What contrast in feelings makes this a pathetic ending? What admirable quality is shown in the character of Guild? Is it a common subject of poem or novel? Is Guild a usual type of man as the hero of a poem? Discuss this. Where is the highest point of interest (climax) of the poem?

THE THREE FISHERS

The Author.—Reverend Charles Kingsley was an English Church clergyman and an author of some poetry and several novels. The latter deal with the problems of social life in England in Victoria's time, chiefly the problem of the struggles of the masses in England to make a livelihood. The poem before us has this for its theme also. Among the works of Kingsley pupils will probably be acquainted with *Water Babies*, *Westward Ho*, *Hypatia*, *Hereward*. Kingsley was the leader of the Low Church Movement in the English

Church as opposed to the High Church party of Newman, who later joined the Catholic Church. This led to a controversy between the two leaders.

Synopsis of the Poem.—The story told in the poem is typical of the trials of the poor fisher folk in an English coast town. Although signs foretold a storm (the moaning of the bar) yet the necessity of gaining a livelihood caused three fishers to go out as usual at the sunset hour to fish, leaving their wives and children anxiously watching them as they sailed away. The storm came as foretold, and the wives watched in the lighthouse tower, keeping the lamps burning bright as a guide for the sailors on their return. The morning revealed the tragedy of it all, for the bodies of the three fishermen were washed up on shore.

Notes.—Fishers set sail at sunset in order to get the advantage of the breeze that blows off shore then. They return after sunrise when the wind blows inshore. "The Night-rack" is a black cloud which is accompanied by violent wind. The bar is the sand washed up by the waves at the harbor mouth. The moaning is caused by the dashing of the waves over the bar, an evidence of a storm on the sea at a point some distance away.

QUESTIONS

1. What expressions in the first stanza are repeated in the other two stanzas? What is the effect of repetition?
2. What sympathy with the poor is expressed in stanza one?
3. What causes of the tragedy are given in the second stanza?
4. What resignation do the survivors show? Why is the moaning of the harbor bar so often mentioned?

FIRE AND DARKNESS (Continued from Nov. Issue)

Chapter X.—Funeral rites in Rome are here described and may be contrasted with our own customs. Funerals of the young took place in the morning while the stars were still shining. The corpse was carried to the grave, feet foremost. First in the funeral procession of Apaecides went the musicians playing a slow march. Next went the hired mourners, a group of women and boys. The clowns, actors, and imitators of the corpse were not present in this case, owing to the fact that the Greek had met a violent death.

The priests of Isis, an Egyptian cult popular at this time, preceded the corpse carrying sheaves. Behind the bier was the chief mourner, in this case, the sister of the deceased, Ione.

The destination of the procession was the Place of Tombs, outside the city gate. Here the corpse was laid on

an altar of pine, while about it were piled faggots to make up the funeral pyre. Then the torch was touched to the wood, and the body was burned to ashes.

The remaining embers were collected, steeped in wine, and placed in a silver urn. A vial of tears and a small coin were added, and the urn was then enclosed in a small chamber in a sepulchre.

Ione, on her return to her home was taken in charge by Arbaces, the Egyptian, against her will. He had the written orders of the praetor to this effect.

Chapter XI.—Nydia, shut up under guard in the house of Arbaces, planned to escape by deceiving the slave who was set to watch her.

Chapters XII and XIII.—Calenus, a greedy priest of Isis, and disciple of Arbaces, has been a witness of the murder of Apaecides by Arbaces. He demands of the latter a bribe to keep the matter secret. He was lured into the dungeon of Arbaces' house and locked in.

Chapter XIV.—The blind girl Nydia escaped, with the intention to inform the praetor of the facts she had learned, but is recaptured, and it would seem that Glaucus must meet his fate in the arena.

Chapter XV.—Here we are given an indication of how the Romans viewed the matters such as we have been relating. Clodius, Pansa, and Lepidus, discuss it. Olinthus could have escaped if he would have offered incense at the altar of Cybele, but being a Christian convert he would not. He was condemned to fight the tiger in the arena. Glaucus was condemned on the false testimony of Arbaces. The people demanded a rich victim for the lion, and the senate condemned him.

QUESTIONS ON CHAPTERS X TO XV

1. Briefly state the part of Sosia in the story. (Chaps. X and XIII).
2. How was Calenus deceived by Arbaces, and why so dealt with? (XII and XIII).
3. Describe a funeral in Rome at the time of the beginning of the Christian era. (Chap. X). In what respects was the ceremonial beautiful and appropriate? How did it differ from our own funeral customs?
4. Name the speaker of the following and the circumstances:
 - (a) "Dark Egyptian, begone. It is thou who hast slain my brother."
 - (b) "The night is the sole time in which we can decipher the decrees of fate; then it is thou must seek me."
 - (c) "Thou may'st easily spare out of those piles enough to make me among the richest priests of Pompeii."

- (d) "That word shall never be spoken."
- (e) "And now to get two such criminals is indeed a joy for the poor fellows. They work hard. They ought to have some amusement." (P. 75).

Summary of Chapter XVI.—Olinthus and Glaucus are imprisoned together. Their conversation ends in the conversion of the latter to the Christian belief.

Chapter XVII.—A description of the scene at the gladiatorial combat is given here. It took place in an open-air amphitheatre of immense size, and the crowd was enormous. The women in the crowd sat in a balcony above the men and separate from them. The day being hot, pipes of water sprinkled the crowd with a cooling spray. The first part of the show was given over to a parade of the gladiators. They were of several types—a giant with a net and three-pronged spear, two Gauls in full armor, Greeks with short swords and naked bodies, and others.

Chapter XVIII.—The contests in the arena are described. First the armed Gauls fought on horseback. One was pierced to the heart. The two Greeks fought. One was killed and the other required to fight in a later contest.

Chapter XIX.—The repulsive nature of the gladiatorial combats is seen in the contest between Niger and Sporus. The latter finally had his antagonist at his mercy. He waited for the signal from the crowd whether he should kill him or not. Their verdict was death.

Chapter XX.—Glaucus and Olinthus are to fight the lion and tiger. As they enter the arena Sallust appears before the praetor with a statement that he has evidence as to the innocence of Glaucus, and the guilt of Arbaces in connection with the murder. There was a demand from the throng that Arbaces be sacrificed to the lion in the place of Glaucus. Just then the earth shook and the great eruption of Vesuvius commenced, which within twenty-four hours destroyed the city and covered it deep with ashes.

QUESTIONS ON CHAPTERS XVI TO XX

1. Who befriended Glaucus, and how? (Chap. XVI).
2. What belief of the Christian made most impression on the Greek?
3. What evidence of impending disaster were noted? (Pp. 79-80).
4. How did Nydia assist Sallust in rescuing Glaucus, (81).
5. Describe the crowd in the arena. (80).
6. Campania is the level district south of Rome. How did the people of the country regard such a holiday as this? (81).
7. Name some types of men among the gladiators. What was Clodius' interest in them? (83).

8. Tell how these fought and the result—Nobilior and Ber-
bix, Lydon and Tetriades, Sporus and Niger, Lydon and
Eumolpus.
9. Why was there greater interest in the last contest?
(94).
10. How did the lion behave when driven into the area?
How was Glaucus saved? What was the effect of the
statements of Sallust and Celenus on the crowd? What
saved Arbaces?

Chapter XXI.—The eruption is described. There was pitch darkness at mid-day. Stones, hot rain, and white ashes rained down on the city.

Chapter XXII.—Nydia was the best guide of the fugi-
tives in the darkness. Her blindness had accustomed her to
use her other senses as guides.

A spendthrift boy was seen to rob his miserly father.
Glaucus was met by Arbaces, but the latter was struck dead
by a falling pillar before he could attack him.

Chapter XXIII.—Nydia, after long search, found Glau-
cus and Ione and guided them to the seacoast, where they
took refuge on a boat. Nydia in despair of losing Glaucus
drowned herself.

Chapter XIV.—Glaucus and Ione went to live in Athens.
They became followers of the Christ. The historical facts
on which the story is based are given—the houses of Pansa
and Sallust are still to be seen in the excavations of Pompeii,
also the temple of Isis. Skeletons corresponding to those of
Diomed, Julia and Calenus have been found, and also the
skeleton of a man of foreign type lying crushed beneath a
fallen column—the remains of Arbaces the Egyptian.

QUESTIONS

1. Mention the main facts descriptive of the eruption.
What form did Pliny say it took at first? (P. 102).
2. By whom and under what circumstances were these
spoken:
 - (a) "Woe to the idolater and the worshipper of the
beast." (109).
 - (b) "Fate smiles upon me even through these horrors."
(112).
 - (c) "The hour is come." (117).
 - (d) "O sacred sea. I hear thy voice invitingly."
3. Mention the things discovered in the ruins of Pompeii
that relate to the fate of (1) Diomed, (2) Julia, (3)
Calenus, (4) Arbaces.



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